Human Races

Human diversity

???









Importance

- **Interesting to consider biological variation may be similar to (or different from) that of other species of animals (e.g., other primates and apes).**

- **How different biological traits developed over evolutionary time**

- **Biomedical, forensic, and sociopolitical implications**

- **Improve public understanding of human evolution:** Terms such as **race and ethnicity are used in everyday conversations**

Oxford English Dictionary (2018), definition

- A **major division** of the human species based on particular **physical characteristics**;
- the **biological origin** of a group of people, or ancestry;
- the fact or condition of belonging to a racial division or group, or the **social qualities associated** with this;
- a group of people sharing the **same culture and language**;
- any group of people or things with a **common feature or features**;
- a population within a species that is distinct in some way, especially a **subspecies.**

- **No consensus among biological anthropologists as to what races are, whether they even exist, and, if they do, how the term should be applied to the human species meaningfully**

If biological anthropologists cannot reach a consensus, how can we?

Ideas about ethnicity that people hold have huge social and political impacts, and notions of race have been part of the motivation behind various forms of **racism and prejudice today,** as well as many wars and genocides throughout history.

Genetic Differences among Human Populations?

Not very much!

- The genetic studies that pointed to our recent African origins
- Also said that,
- We are a very new species that has not had time for strong genetic divergence.
- E.g large mammals and showed that coyotes, wolves, deer, gazelles, and elephants have anywhere from three to nine times the genetic diversity between their respective populations than we humans do among ours.

THE HISTORY OF "RACE" CONCEPTS

"Race" in the Classical Era

- The earliest classification systems: The Ancient Egyptians had the *Book of Gates,* dated to the New Kingdom between *1550 B.C.E. and 1077 B.C.E.*

Distinctive category of people, distinguishable by their skin color, place of origin, and even behavioral traits.

NON-SCIENTIFIC!



Figure 13.2 (from left to right) Depicting a Berber (Libyan), a Nubian, an Asiatic (Levantine), and an Egyptian, copied from a mural of the tomb of Seti I.

- The Roman philosopher Pliny the Elder (23–79 C.E.)

Encyclopedia *Naturalis Historia*
Three categories: civilized peoples, barbarians, and monstrous individuals.

Relied simply on readily visible phenotypic traits, such as body size, skin color, and facial shape. **NON-SCIENTIFIC!**

Plato (427–348 B.C.E.) and Aristotle (384–322 B.C.E.).
Inherently (or genetically) more instinctive rulers, while others are more natural fits for the life of a worker or slave. **NON-SCIENTIFIC!**


C. PLINII SECUNDI
NATURALIS HISTORIÆ,
TOMUS PRIMUS.
Cum Commentariis & adnotationibus HERMOLAI BARBARI, PINTIANI, RHENANI, GELENII, DALECHAMPII, SCALIGERI, SALMASII, Is. VOSSII, & Variorum.
Accedunt præterea variæ Lectiones ex MSS. complurimis ad oram Paginarum accuratè indicatæ.
Item JOH. FR. GRONOVII Notarum Liber Singularis ad Illustrem Virum *Johannem Capelanum.*
MOVEBOR
LUGD. BATAV. ROTERODAMI. } Apud HACKIOS, A°. 1669.

Figure 13.3 Front page of Pliny the Elder's Naturalis Historia.

"Race" during the Scientific Revolution

- **1500-1600**
- **Linnaeus is the author of *Systema Naturae (1758)***
    - **Anatomical similarities**
- **Despite these useful contributions to the biological sciences, Linnaeus still subdivided the human species into four varieties, with overtly racist categories based on skin color and "inherent" behaviors**
- 1400s and 1700s was marked by many new and intentionally violent encounters overseas: Colonism
- **No understanding of genetics meant – category based on recent ancestry, food, culture, behavior, concept of "others" and "inferiors"**

- **Johann Friedrich Blumenbach** (1752–1840), classified humans into five races based on his observations of cranial form variation as well as skin color.

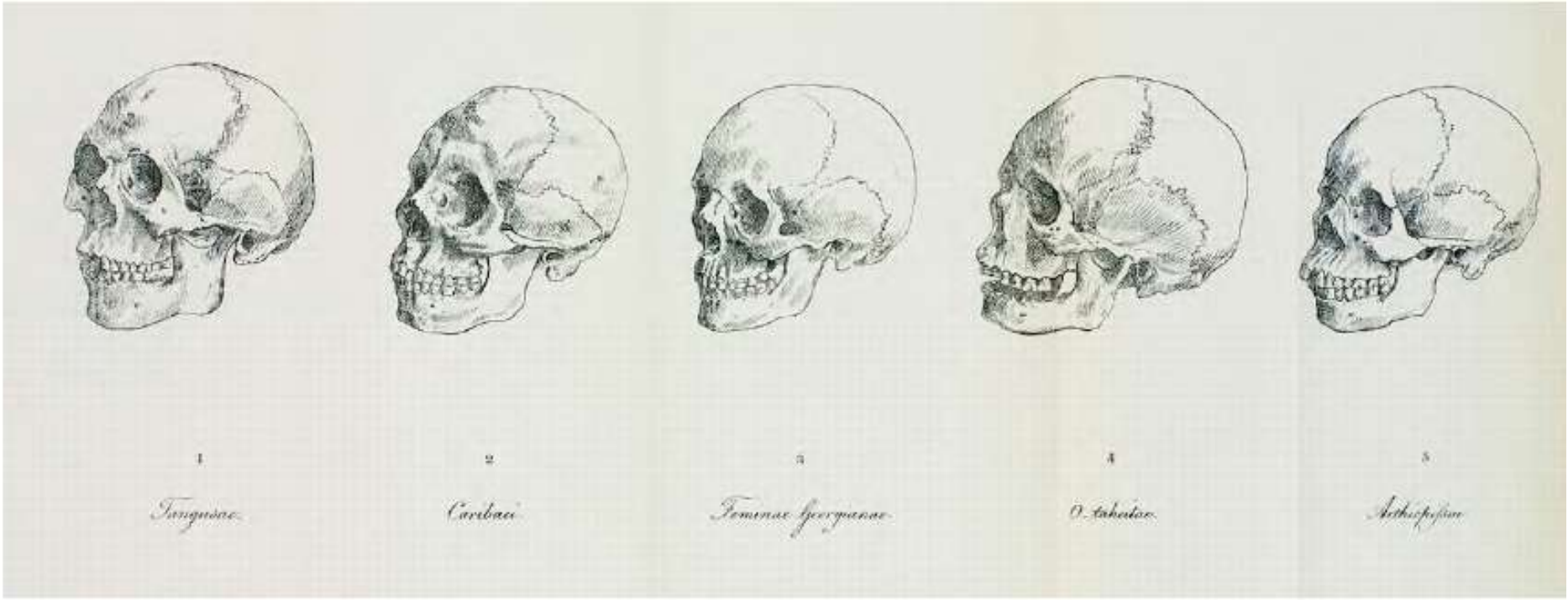


Figure 13.7 Five skull drawings representing specimens for Blumenbach's "Mongolian," "American," "Caucasian," "Malayan," and "Aethiopian" races.

"Caucasian" form as the original form, others "degraded" form

“Race” and the Dawn of Scientific Racism

- 1800s and mid-1900s
- **polygenetic** (viewing all people as having separate origins) rather than **monogenetic** (viewing all people as having a single origin)
- Measurement of human physical features (**anthropometry) truly became popularized**
- Skin color, skull shape, or observations of behavior being analyzed as the data, empirical studies in the 1800s pushed the idea even further that **Europeans were culturally and biologically superior**
- **Samuel George Morton** (1799–1851): a scholar who had a large role in 1800s scientific racism. By measuring cranial size and shape, he calculated that “Caucasians,” on average, have greater cranial volumes than other groups, such as the Native Americans and “Negros.”

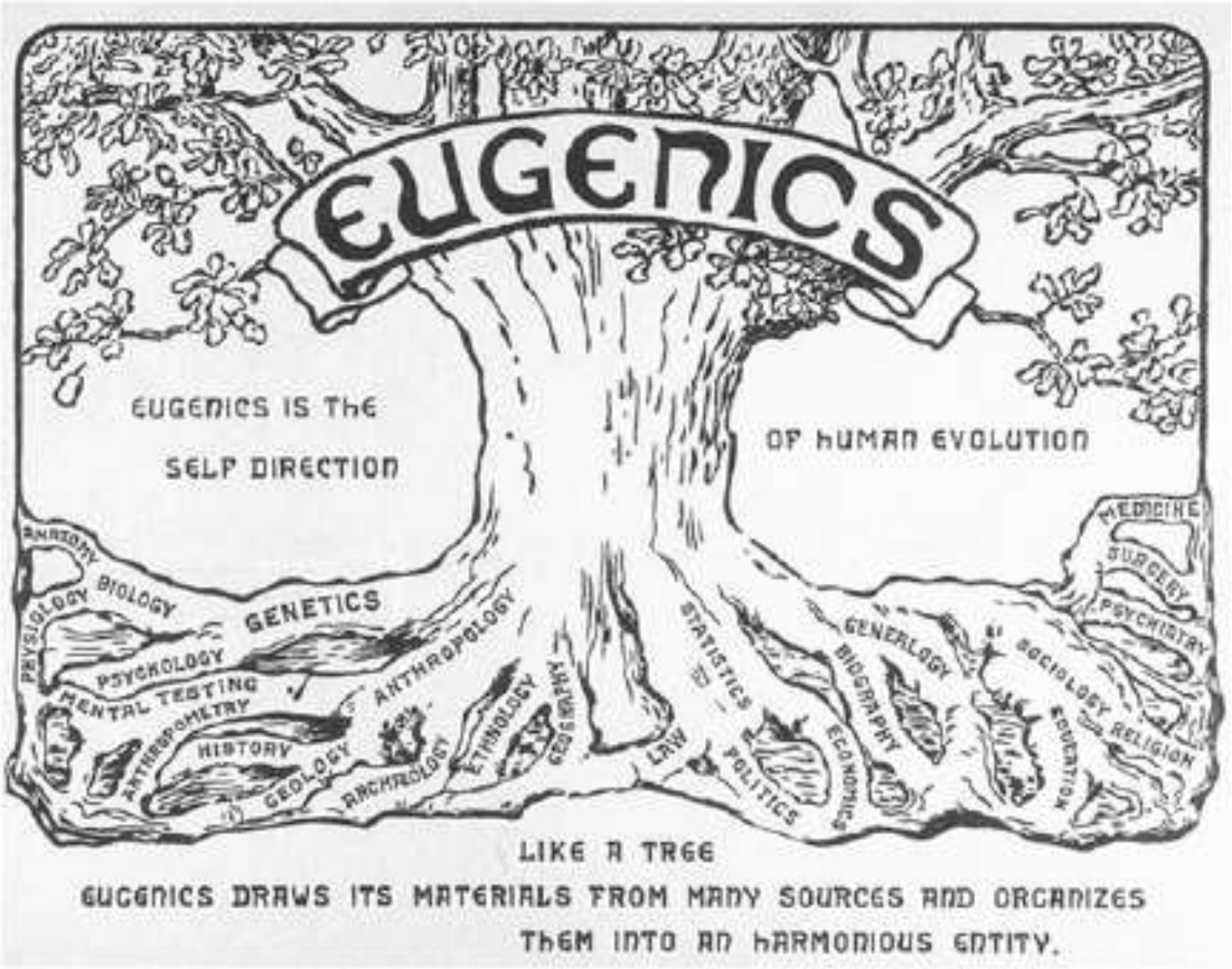


Figure 13.9 Logo of the Second International Exhibition of Eugenics held in 1921.

- Today we know that cranial size variation depends on such factors as **Allen's and Bergmann's rules** which give the more likely explanation for the largest heads being found in people living among colder regions (i.e., Europeans) being climatic adaptation (Beals et al. 1984).

- In colder environments, it is advantageous for those living there to have larger and rounder heads because they conserve heat more effectively than slenderer heads (Beals et al. 1984).

“Race” and the Beginnings of Physical Anthropology

- Early 20th century
- Aleš Hrdlička (1869–1943) was a Czech anthropologist
- Franz Boas (1858–1942) was a German American anthropologist
- Human behaviors were influenced primarily not by genes but by social learning.
- Societies do not exist on a hierarchy or gradation of “civilizedness” but instead are shaped by the world around them, their demographic histories, and the interactions they have with other groups.

"Populations" Instead of "Races"

- Borrowed this way of framing human groups from contemporary population geneticists



Figure 13.10 Theodosius Dobzhansky, an important scientist who formulated the 20th-century "modern synthesis" reconciling Charles Darwin's theory of evolution and Gregor Mendel's ideas on heredity.



Figure 13.11 Julian Huxley (1942).

- **Modern Synthesis**
- **“Races”** were then **defined simply as populations** that differ in the frequency of some gene or genes.
- **“population”** is a group of individuals potentially capable of or actually interbreeding due to shared geographic proximity, language, ethnicity, culture, and/or values.
- Members of the same population may be expected to share many genetic traits (and, as a result, many phenotypic traits that may or may not be visible outwardly).
- Alleles
- Human diversity cannot be broken into discrete “races,” because most **physical traits vary on a continuous**
- Example: human height, eye/skin colour, lactose intolerance etc.

- Anthropologists working in the 1960s and 1970s who shifted their focus toward the study of individual traits rather than the study of groups (populations, races).

- Frank B. Livingstone (1928–2005) wrote: "**There are no races, only clines" (1962).** A *cline is a gradation in the frequency of* an allele/trait between populations living in different geographic regions.

- Genetic testing to uncover the true frequencies

- Clinal patterns arise when **selective pressures** in one geographic area differ from those in another as well as when **people procreate and pass on genes together with their most immediate neighbors.**

Mechanisms: Natural selection (e.g. lactose intolerance, skin colour); cultural selection

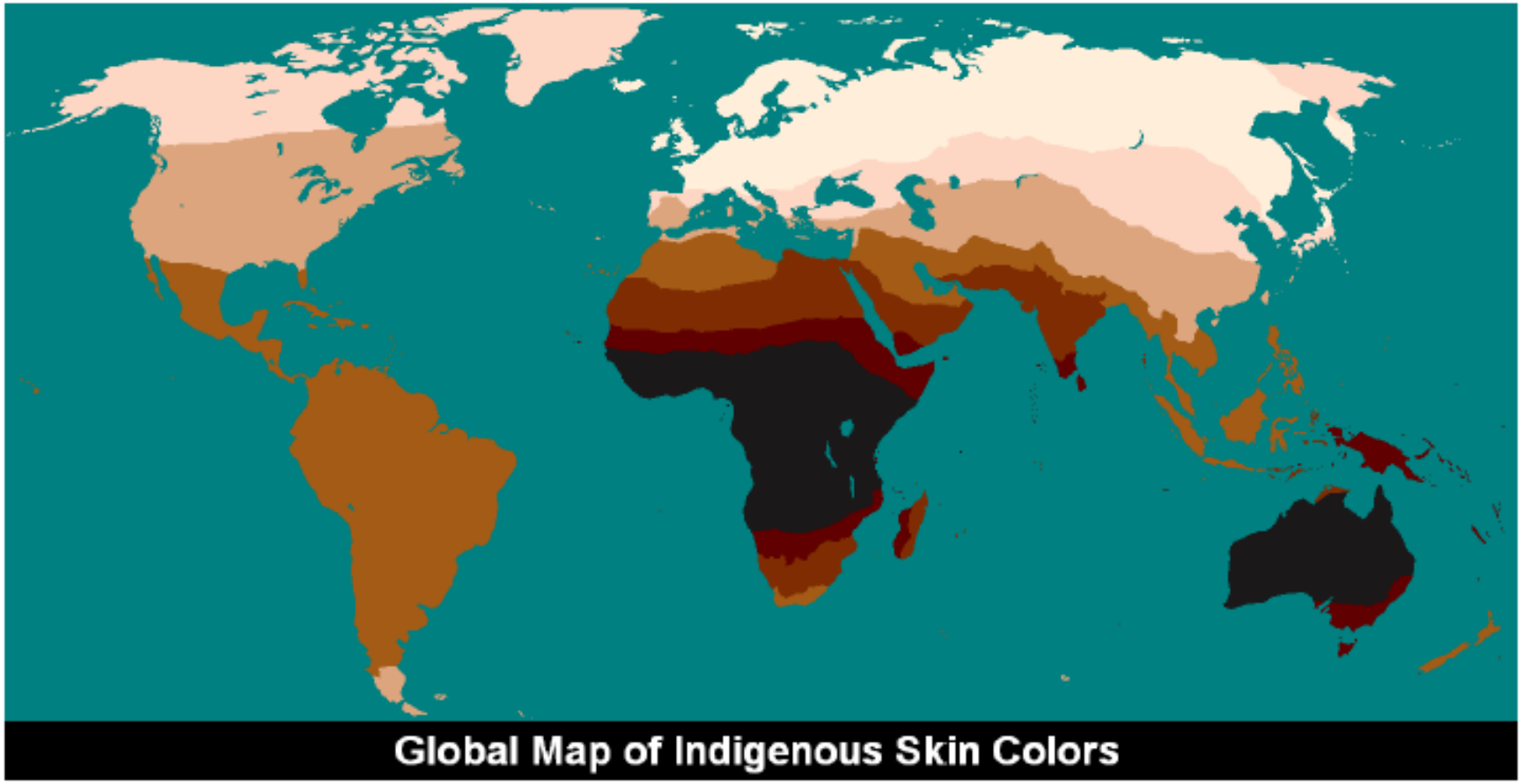


Figure 13.12 Global map of indigenous skin colors.

Mechanisms: Gene flow and Genetic drift

- neutral processes can produce clinal distributions
- populations residing nearer to one another are more likely to interbreed and share genetic material (i.e., undergo gene flow).

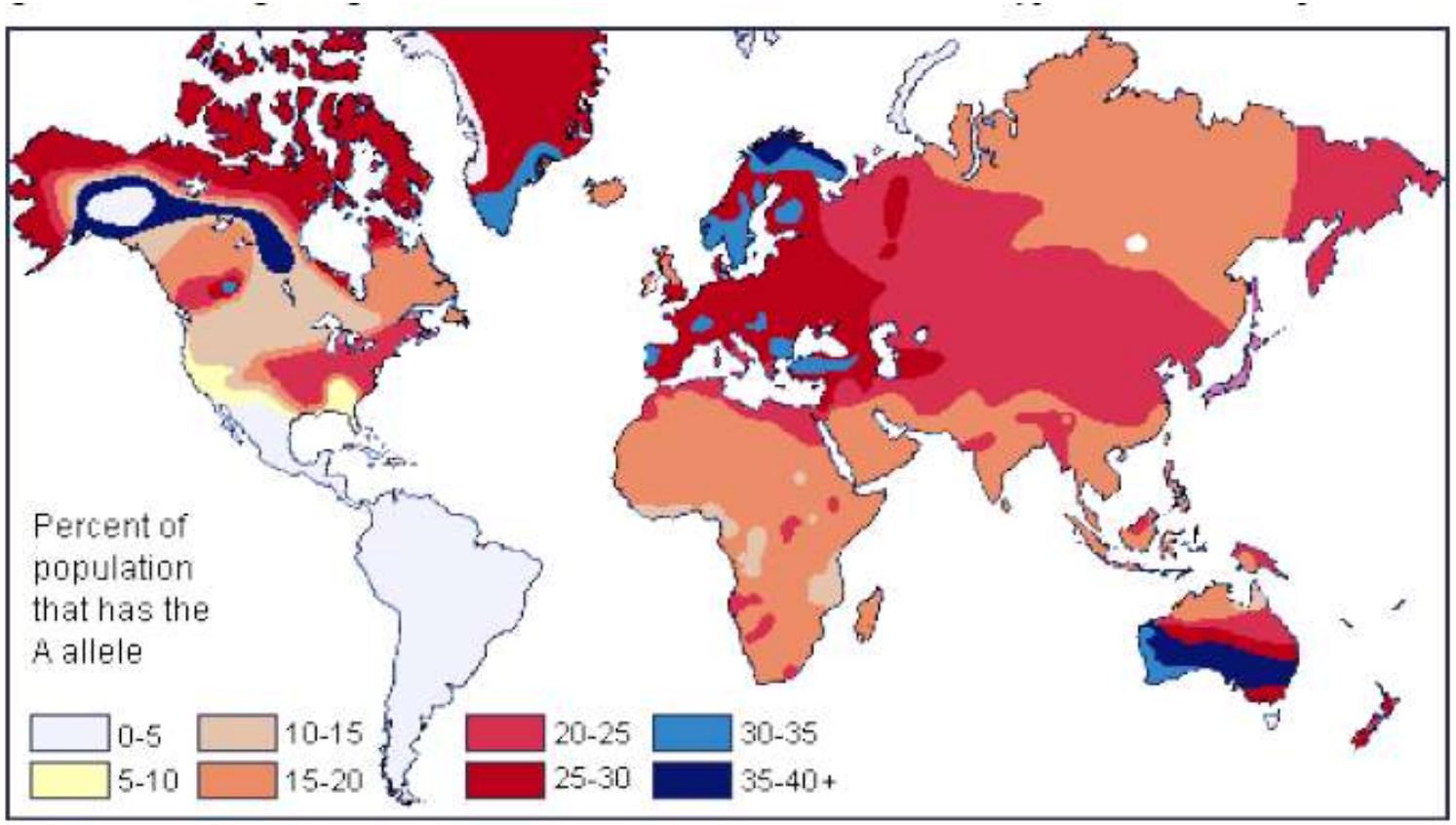


Figure 13.13a Global distribution of blood group A.

The Apportionment of Human Variation:

Genetic Diversity Is Greater Within-Group Than Between-Groups

- **Race-based classifications is they relied on an erroneous idea that people within a typological category were more similar to each other than they were to people in other groups**
- However, since around 50 years ago, **scientific studies have shown that the majority of human genetic differences worldwide exist *within groups or so called "races"***
- **Lewontin (1972**) used 17 genetic markers including blood proteins
- Identified that human genetic differences (85.4%) were found within local subpopulations (e.g., the Germans),
- Whereas 8.3% were found between populations within continental human groups, and 6.3% were attributable to traditional "race" groups (e.g., "Caucasian" or "Amerind").

- Noah Rosenberg and colleagues (2002):
- 377 markers
- These findings have been important for scientifically rejecting the existence of biological races (Long and Kittles 2008).
- (93%–95%) can be accounted for by within-population differences, small proportion of genetic variance (3%–5%) can be attributed to differences among major groups
- Concept of "**ancestral populations**" **also false**. However, it would be wrong to assume from these genetic results that highly differentiated and **"pure" ancestral groups ever existed**.

- These groupings reflect differences that have arisen over time due to clinal patterning, genetic drift, and/or restricted or unrestricted gene flow (Weiss and Long 2009).



Figure 13.14 Sub-Saharan Africa (shaded dark/green).

Out-of-Africa model

Serial founder effects

Genetic variations actually decrease as we move away from Sub-Saharan population

There are no “inherent” or “innate” differences between human groups.

Instead, variation derives from some degree of **natural selection**, as well as neutral processes like **population bottlenecking**, random **mutations in the DNA, genetic drift, and gene flow through between-mate interbreeding.**

- **Isolation-by distance model,** which predicts that genetic similarity between groups will decrease exponentially as the geographic distance between them increases.
- Greater and greater restrictions to gene flow presented by geographic distance
- Cultural and linguistic differences that occur as a result of certain degrees of isolation.
- This research demonstrates that human variation is continuous and cannot be differentiated into geographically discrete categories.
- Example of skin colour as greater variation and blood type

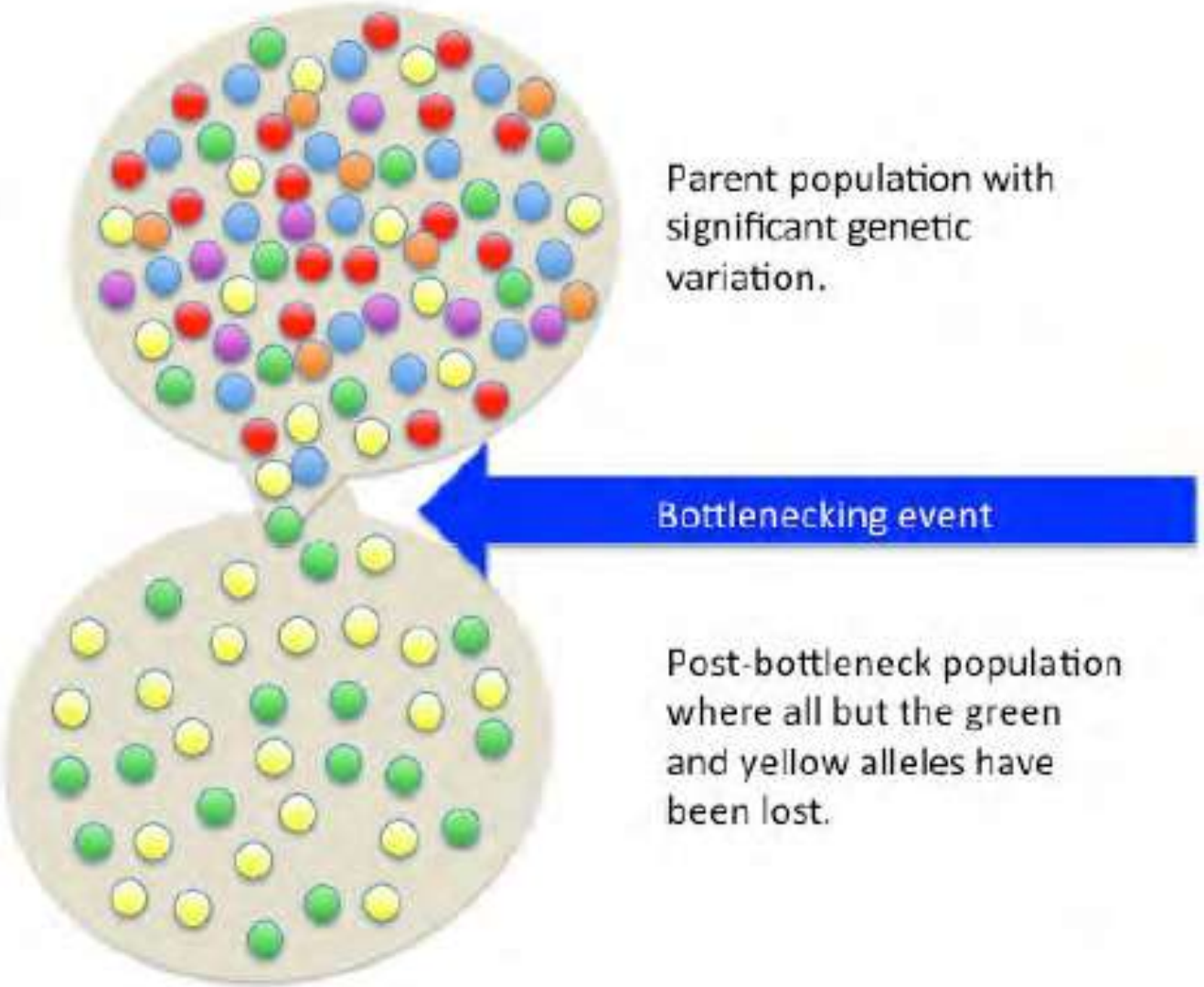


Figure 13.15 The founder effect is a change in a small population's gene pool due to a limited number of individuals breaking away from a parent population.

Humans have higher homogeneity compared to many other species

- **Humans are 99.9% identical to one another**
- **Molecular approaches to human and primate genetics tells us that external differences are merely superficial.**
- **Reasons—**
- Groups descended from that smaller “ancestral group” would be similar genetically
- Our species is really young (150,000 to 300,000 years)
- little time for random genetic mutations

Phenotypic Traits That Reflect Neutral Evolution

- Biological traits vary independent of each other—that is, they don't get inherited in a correlative manner with other genetically controlled traits (**Non-concordance)**

- Revisiting cranium size: Anthropologists found greater variation within a group than different populations

- While ancient and historical thinkers previously thought "race" categories could reasonably be determined based on skull dimensions, **modern-day analyses using more informative sets of cranial traits simply show that migrations out of Africa and the relative distances between populations** can explain a majority of worldwide cranial diversity (Betti et al. 2009).

Phenotypic Traits That Reflect Natural Selection

- While most genetic diversity reflects neutral variation due to population migrations, geographic isolation, and restricted gene flow dynamics**, some human genetic/phenotypic diversity is best explained as local adaptation to environmental conditions (i.e., selection).**
- **Besides** social implications this has medical and clinical applications
- Genetic diversity in predispositions to disease and/or good health is likely higher among people of African descent due to greater genetic diversity.
- **Genetic variation within a group (earlier defined races), different** genotype calls for gene-environment relationship in medicine.
- **Physical features may tell us about migration patterns rather than race**

- To conclude, utilizing *races to describe human biological variation is not accurate or productive.*
- *Using a select few* hundred genetic loci, or perhaps a number of phenotypic traits, it may be possible to assign individuals to a geographic ancestry or migration patterns
- Humans have significantly less genetic diversity
- Many biological characteristics in humans are actually determined non-concordantly and/or polygenically.
- Genetic distances are correlated with geographic distances among the global human population.
- The effects of gene flow, genetic drift, and population bottlenecking are reflected in some phenotypic traits, such as cranial shape.
- **Genetic analyses of human diversity do not support 20th-century (or even earlier) concepts of race.**

- **It is important that teachers, researchers, and students recognize and assume the responsibility of influencing public perspectives of human diversity.**

- **Should we continue to attribute any value in “race” concepts older than 1950, based on our current understandings of human biological diversity? Write a few points to support your answer**

- **What evolutionary processes are responsible for producing genotypic/phenotypic diversity within and between human populations?**

- **How should we communicate scientific findings about human biological variation more accurately and responsibly to those outside the anthropological discipline?**

- **Write a short note on Races defined on the basis of physical characteristics as Caucasoid, Negroid, and Mongoloid. Explain these features using genetic drift, natural selection.**